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FACTORS INFLUENCING RESEARCH SKILLS

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Abstract

The purpose of this study was to investigate factors that influenced the research skills of grade 9 students. The population was 420 students of grade 9 at Secondary Educational Service Area Office 36, 2018 academic year. The samples were 105 students and selected by using a simple random sampling technique. Research tools were (1) Scientific attitudes Self-Assessment (2) Bond-Visual Analog Scale and (3) Research Ethics Checklist and (4) Research Skill Inventory. The researcher used multiple linear regression analysis to analyze the data. The findings revealed that scientific attitudes, emotions, and research ethics were the factors influencing research skills.

Keywords: Scientific attitudes, Emotions, Research Ethics, Research Skills

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Introduction

Research skills refer to an ability that involves setting research questions, searching for information, planning the research process, collecting data, analyzing data, interpreting and synthesizing findings, and presenting research findings. These performances are standard abilities that learners must possess to conduct research effectively (Srikoon, Bunterm, Nethanomsak, and Ngang, 2016 and Srikoon, Bunterm, Samranjai, and Wattanathorn, 2014).

Consequently, there must be an update regarding influencing research skills. Some studies regarding research skills were conducted in the past ten years; for example, Srikoon, Bunterm, Nethanomsak, and Ngang (2016) developed a research skills self-assessment. Moreover, Srikoon, Bunterm, Nethanomsak, and Ngang (2018) developed a teaching model of research-based learning integrated with educational neuroscience or the 5P Teaching Model to enhance learning achievement, creativity, and research skills. Apaivatin, Srikoon, and Khemkhan (in press) suggested that teachers should include research skills activities in the learning process. Srikoon, Bunterm, Samranjai, and Wattanathorn (2014) stated that the knowledge of factors that influenced research skills in developing teaching routines, for example, activities, assessment, and evaluation, must be further explored.

Some factors that might affect research skills are research ethics, research attitudes, and emotions. Research ethics are concerns in conducting research; for instance, if learners possess research ethics, they tend to have good research skills (Srikoon, 2017). Research attitudes have a high impact on research skills; for example, if learners have positive attitudes toward learning, they tend to have outstanding research skills (Srikoon & Khamput, in press). Further, emotions affect behaviors: if learners have positive emotions, they tend to have positive behaviors (Srikoon, Viriyapong, and Chutiman, 2018).

This study aims to investigate the factors mentioned above, whether they affect research skills. The findings could be another resource for education in conducting further studies regarding research skills.

Conceptual feamework

Srikoon, Bunterm, Nethanomsak, and Ngang (2016) mentioned that research skills refer to formulating research questions, reviewing information, planning research design, collecting, processing, interpreting, and presenting research data. Moreover, Srikoon & Champut (in press) stated that research attitudes affect research skills. Srikoon, Viriyapong, and Chutiman (2018) mentioned that emotions also affect behaviors.

Research objectives

To study factors influencing research skills

Research Methodology

The study employed survey research, and the methodology was as follows:

1. Research population and target groups

1.1 Research population

The population was 420 students of grade 9, Theong Wittayakom School, under the Secondary Educational Service Area Office 36, 2561 academic year, Theogn District, Chiang Rai.

1.2 Target groups

The samples were 105 of the grade 9 students with simple random sampling

2. Research Duration

The duration was one week from June 1-7, 2019.

3. Research tools

The research tools were as follows:

(1) Scientific attitudes assessment. This research employed the concept of Srikoon, Bunterm, Nethanomsak, Ngang (2018) to develop. This assessment contains 25 items and is a 5-rating scale assessment; further, its construct validity was 0.720.

(2) Emotions Questionnaire. This researcher adapted the concept of Srikoon, Viriyapong, & Chutiman (2018) to develop the 21-item questionnaire and had its construct validity examined as 0.898.

(3) Research ethics assessment. The researcher developed the 21-item checklist based on Srikoon (2017)'s work and had its construct validity was 0.934.

4. Data analysis

4.1 The data was analyzed using mean, standard deviation, coefficient of variation, minimum, maximum, skewness, kurtosis, and correlation coefficient.

4.2 The researcher employed multiple linear regression analysis by using the enter method because the method is able to deal with a small set of predictors and gives the best prediction equation.

Research Findinge

1. Descriptive statistics

The researcher used descriptive statistics to confirm distributions in every target group, which are mean ($\bar{x}$), standard deviation (S.D.), coefficient of variation (CV (%)), minimum (MIN), maximum (MAX), skewness (SK), and kurtosis (KU) as shown in Table 1.

Table 1 descriptive statistics to confirm distributions

Variables	Statistics						
	$\bar{x}$	S.D.	CV (%)	MIN	MAX	SK	KU
X_1	3.261	0.481	14.763	1.960	5.000	0.256	0.152
X_2	6.346	1.784	28.116	2.313	9.938	0.032	-0.720
X_3	17.238	3.393	19.681	6.000	21.000	-0.736	0.072
Y	3.428	0.605	17.637	1.714	4.714	-0.094	0.195

The four variables are scientific attitudes (X_1), emotions (X_2), research ethics (X_3), and research skills (Y). The skewness (SK) is between -0.094 to 0.256, which is less than 0.3. Kurtosis (KU) is between -0.720 to 0.195, which is less than 0.8. Therefore, every variable is in a normal distribution.

2. Correlation of variables shows in Table 2 as follows:

Table 2 Correlation of variables

Variables	X_1	X_2	X_3	Y
X_1	1			
X_2	0.022*	1		
X_3	0.186*	0.143*	1	
Y	0.414*	0.254*	0.301*	1

*p<0.05

Table 2 shows an analysis of the correlation between the four variables: scientific attitudes (X_1), emotions (X_2), research ethics (X_3), and research skills(Y). Six pairs significantly showed correlation at 0.5, and the correlation coefficient values range from 0.022-0.414.

3. Research findings

The researcher employed multiple regression to investigate factors that influenced research skills, as in Table 3.

Table 3 Analysis of factors influencing research skills by using multiple linear regression

Model	Unstandardized Coefficient		Standardized	T	Sig.
	B	Std.Error	Coefficient		
Constant	0.822	0.431	-	1.906	0.039
X_1	0.467	0.109	0.372	4.300	0.000
X_2	0.073	0.029	0.217	2.521	0.013
X_3	0.036	0.016	0.201	2.294	0.024

Table 3 shows that three predictors, scientific attitudes (X_1), emotions (X_2), and research ethics (X_3), influenced research skills (Y) for 27 percent of reliability (R^2 =0.270). Raw score and standard score equations are as follows:

The raw score equation

$$Y = 0.822 + 0.467 (X_1) + 0.073 (X_2) + 0.036 (X_3)$$

The standard score equation

$$Y' = 0.372 (Z_1) + 0.217 (Z_2) + 0.201 (Z_3)$$

Discussion

According to the findings, scientific attitudes, emotions, and research ethics impacted research skills. Enhancing research skills educators possibly includes learning activities applying the three factors to promote learners' research performance, which relates to the concept of the 5 P Teaching Model integrated with research-based and educational neurosciences which include scientific attitudes activities: setting research questions, searching for information, and recording information (Srikoon, Bunterm, Nethanomsak, & Ngang, 2018 and Srikoon, Bunterm, Nethanomsak, & Ngang, 2017). Moreover, the 5 P Teaching Model provides activities that enhance positive emotions by encouraging learners to be polite and form a collaborative learning atmosphere. These could reinforce learners to be positive and put the effort in their study (Srikoon, Viriyapong, & Chutiman, 2018). Additionally, the 5P Teaching Model allowed learners to possess research ethics when conducting research (Srikoon, 2017). Therefore, educators should include these three factors; scientific attitudes, emotions, and research ethics in teaching and learning processes to promote research skills. Notably, our learners would possess research skills and would be able to apply them in their daily life effectively.

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